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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WINFRIED STUBBE and ANDREAS POPPE

Appeal 2009-006435
Application 10/510,993
Technology Center 1700

Decided: April 1, 2010

Before JEFFREY T. SIMTH, LINDA M. GAUDETTE, and
JEFFREY B. ROBERTSON, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision finally rejecting claims 1-7 and 9-20 (Final Office Action ("Final"), mailed Jul. 5, 2007, 1). (Appeal Brief ("App. Br."), filed Mar. 3, 2008, 1.) We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The Examiner maintains (Examiner's Answer ("Ans."), mailed May 1, 2008, 3-5), and Appellants request review of (App. Br. 4), the following grounds of rejection:

1. claims 1, 3-7, and 9¹-20 under 35 U.S.C. § 102(e) as anticipated by US 6,599,631, issued Jul. 29, 2003 ("Kambe")²; and
2. claim 2 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over Kambe.

Claim 1, the sole independent claim, is reproduced below from the Claims Appendix to the Appeal Brief:

1. An aqueous dispersion, comprising

(A) at least one swellable polymer and/or oligomer containing at least one functional group that is at least one of an anionic functional group, a potentially anionic functional group, and/or a nonionic hydrophilic functional,

(B) surface-modified, cationically stabilized, inorganic nanoparticles of at least one kind, wherein the nanoparticles are modified with at least one compound of the general formula I:



in which the indices and variables have the following meanings:

S is a reactive functional group;

L is an at least divalent organic linking group;

¹ We note that claim 9, as it appears in the Claims Appendix to the Appeal Brief, depends from canceled claim 8.

² The Examiner incorrectly identifies canceled claim 8 as subject to this ground of rejection. (See Ans. 3.)

H is a hydrolyzable monovalent group or a hydrolyzable atom;

M is a divalent to hexavalent main group or transition group metal;

R is a monovalent organic radical;

o is an integer from 1 to 5;

m+n+p is an integer from 2 to 6;

p is an integer from 1 to 6; and

m and n are zero or an integer from 1 to 5,

(C) at least one compound selected from the group consisting of amphiphiles and organic compounds which are capable of forming chelate ligands, and

(D) at least one crosslinking agent,

wherein the aqueous dispersion has a pH of from 2 to 7.

Appellants rely on the same arguments in traversing both grounds of rejection. (*Compare* App Br. 5-9 with 10-12.) These arguments are directed to limitations found in independent claim 1. We identify the following issue as dispositive of the appeal: Did the Examiner err in finding that claim 1 reads on Kambe's disclosure of an aqueous dispersion containing a polymer, inorganic particles, and linker molecules?

We answer this question in the negative.

Appellants do not dispute that component (A) of claim 1 reads on Kambe's polymer. (*See generally*, App. Br., e.g. p. 5, 2nd para.)

The Examiner found that Kambe discloses linker molecules having a functional group which meets the limitations of Appellants' formula I compound (claim 1, component (B)) and inorganic nanoparticles which are

metal/metalloid oxide particles. (Ans. 4 and 6-7 (citing Kambe, col. 14, ll. 14-29).) Appellants do not dispute this finding. (*See generally*, Reply Brief (“Rep. Br”), filed Jul. 1, 2008.)

The Examiner found that Kambe discloses forming an aqueous dispersion under conditions in which the surface of the inorganic particles is first modified by chemical bonding to one or more the linker molecules, followed by the addition of a polymer to the aqueous dispersion. (Ans. 6 (citing Kambe, col. 6, ll. 28-30 (“[T]he inorganic particles are modified on their surface by chemical bonding to one or more linker molecules.”)); *see also*, Ans. 3 (citing Kambe, col. 6, ll. 29-47); Kambe, col. 6, ll. 32-34 (“The linker molecules . . . functionalize the inorganic particles.”) and ll. 34-36 (indicating that the linker molecules may bond to the inorganic particles prior to bonding to the polymers).)

The Examiner also found that components (C) and (D) of claim 1 read on Kambe’s linker compounds because they function as crosslinking agents and are capable of forming chelate ligands. (Ans. 3-4 (citing Kambe, col. 5, ll. 31-40 (“The linker compounds have two or more functional groups. One functional group of the linker is suitable for chemical bonding to the inorganic particles. . . . Another functional group of the linker is suitable for covalent bonding with the polymer.” “Chemical bonding is considered to broadly cover bonding with some covalent character with or without polar bonding and can have properties of ligand-metal bonding along with various degrees of ionic bonding.”).)

Appellants characterize Kambe as disclosing “a reaction intermediate” in the form of an aqueous dispersion containing linker molecules which can first modify/react with the inorganic particles, followed by bonding to the

polymer to form a solid composition. (App. Br. 7.) Appellants contend that “any inorganic particle reacted with a linker molecule is simultaneously being consumed by subsequent reaction with the polymer” and, therefore, Kambe does not disclose a dispersion containing a polymer, surface-modified nanoparticles and *a separate* crosslinking agent as required by claim 1. (App. Br. 8.)

Appellants’ argument is not supported by Kambe’s disclosure.

Kambe discloses forming a dispersion containing both inorganic particles which have been surface modified by a linker compound, and additional crosslinking agent, i.e. linker compound which is not reacted with the inorganic particles. (*See* col. 9, ll. 2-5 (“Depending on the conditions during the combination of the linker to the inorganic particles, some inorganic particles can be bonded to two or more linkers while other inorganic particles may not be bonded to any linkers.”); col. 21, ll. 47-58 (explaining that some linkers are self-polymerizing and adjustment of reaction conditions will control the amount of linkers which bond to the particle surface and the amount which self-condense); *cf.* col. 8, ll. 2-3 (indicating that a linker may include more than two functional groups); col. 12, ll. 66-67 (indicating that polycondensation may form crosslinkers).) Kambe teaches that bond formation between a polymer added to the dispersion and the linker compound can be controlled by adjusting reaction conditions and/or addition of a catalyst. (*See* col. 21, ll. 22-47 and 59-67.) In other words, inorganic particles reacted with a linker molecule are not necessarily “simultaneously [] consumed by subsequent reaction with the polymer” as suggested by Appellants (App. Br. 8); rather, the polymer may be present in the dispersion, separate from (i.e., not bonded to) the linking

compound and surface-modified inorganic particles. Therefore, contrary to Appellants' contention, the Examiner had a reasonable basis for finding that Kambe discloses a dispersion containing a polymer, surface-modified nanoparticles, and a separate crosslinking agent (*see Kambe, col. 14, ll. 30-34* (distinguishing between the functional group bonded to the nanoparticle and the functional groups of the linker compound: "The identity of the linker functional group that bonds with the inorganic particle may also be modified due to the character of the bonding with the inorganic particle. . . . In any case, a resulting or product functional group is formed joining the linker molecule and the inorganic particle."))).

Appellants also contend the Examiner failed to properly construe the claim 1 limitations pertaining to components (C) and (D) as requiring two separate and distinct compounds. Appellants argue the Examiner has not established a *prima facie* case of anticipation because the Examiner relies on the same compound, Kambe's linker compound, for a teaching of components (C) and (D). (*See e.g.*, App. Br. 9 and Rep. Br. 4-5.)

We have considered the claim language in light of the Specification, but do not agree with the narrow interpretation of the claims advanced by Appellants.

The Specification describes organic compounds able to form chelate ligands (claim 1, component (C)) as containing at least two functional groups which are able to coordinate with metal atoms or metal ions. (App. Br. 2 (citing Spec. 14: 31-15:8).) "The [S]pecification defines a crosslinking agent [(claim 1, component (D))] as a material containing reactive functional groups which are able to undergo reactions with themselves *and/or* with complementary reactive functional groups." (App.

Br. 3 (citing Spec. 15:16-16:31) (emphasis added.) “The separate crosslinking agent contains functional groups that are reactive with complementary groups on the polymer or oligomer, on the surface-modified nanoparticles, in the amphiphile, *or* with themselves.” (App. Br. 6 (citing Spec. 15:17-19) (emphasis added.) It is not apparent from the language of the claims, or the Specification, why the same compound cannot meet both of the aforementioned requirements.

Because we are in agreement with the Examiner’s claim interpretation (*see* Ans. 4), we are not persuaded of error in the Examiner’s finding that claim 1 components (C) and (D) read on Kambe’s linker compound. In other words, Appellants have not explained why the Examiner erred in finding that Kambe discloses a linker compound which is both an organic compound containing at least two functional groups which are able to coordinate with metal atoms or metal ions, and a material containing reactive functional groups which are able to undergo reactions with complementary groups in the polymer *or* surface-modified nanoparticles.

CONCLUSION

Appellants have not persuaded us of error in the Examiner’s finding of anticipation. Therefore, the decision of the Examiner rejecting claims 1-7 and 9-20 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED

Appeal 2009-006435
Application 10/510,993

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